

## **Appendix B: 1998 User Survey at Waldo Lake**

In preparation for the Waldo Lake -Managing Recreation Use EA, the Middle Fork Ranger District designed and conducted visitor surveys to better understand the population of lake visitors. An earlier user survey was also completed in 1997 using a different survey protocol.

The 1997 survey involved completing a half page of visitor and behavior descriptions completed by district interviewers at the lake, or by visitors at prominent self-issue locations (*e.g. trailheads and boat launches*).

The survey in 1998 was statistically more rigid in design and more comprehensive than the 1997 survey. The 1998 survey focused on similar visitor and recreation use data as the 1997 survey, but used a stratified and unbiased sampling scheme. In 1998, 3143 numbered surveys were handed to visitors traveling up the Waldo Lake Road during 170 sample periods of three-hours each that were randomly stratified across 132 sample days. The earliest survey period began at 8:00 am and the latest survey period started at 7:00pm. Surveying began on June 22, 1998 (Monday) and ended on October 31, 1998 (Saturday). Fridays and Saturdays were randomly allocated two different survey periods to recognize the increased traffic flows on weekends. Contacted visitors were asked to complete the survey and return them to drop points at campgrounds and boat launches.

### **Survey Information**

Both 1997 and 1998 surveys collected characteristic data on visitors and the activities they pursued at Waldo Lake. Visitor characteristics included:

- Dates of Visit
- Zip Code
- Number of People in Party
- Number of Stock Animals and Dogs

The primary focus of both surveys was documenting the types of visitor activities and included:

- Camping behavior and locations around the lake
- Trail Use and Mode of Travel
- Boating behavior and Mode of Travel (*including motor types*)
- Other Types of Lake Activities

### **Data Summary for 1998 Visitor Survey**

Survey information can be evaluated in two distinct ways. The typical way would be to generate some trends about the nature of visitors at Waldo Lake and the activities they pursue. This method would characterize survey respondents, and treat all respondents in the same manner.

The following questions about respondents could be answered with the survey data:

- Visitation trends
- Average number of people per party
- Percentage of respondents camping and where they camp
- Percentage of respondents pursuing various recreation activities
- Percentage of boat types brought to the lake

Each question could be further segregated by characteristic groups, such as “What percentage of respondents were camping and boating”.

Additional analysis allows an examination of recreation use trends at Waldo Lake during defined periods. In this analysis, survey data would be expressed in visitor days (persons per day) and would give greater representative weight to visitors whose length of stay is longer. Such a design allows the District to examine the carrying capacity trends or activity patterns for particular time periods (*days, weeks, or months*).

However, such an analysis would introduce bias when answering questions addressed by the first analysis method. The second analysis design could prove useful in evaluating visitor impacts, particularly if the entire visitor population for the year were known. Appropriate questions to ask under the second analysis would be:

- What percent of the surveyed population is participating in various recreation activities during any given time period:
  - camping, boating, hiking, etc.
  - motorized versus non-motorized
  - camping at dispersed versus campground sites
- For a specified time period, what is the profile of the visiting population
- What is the frequency or distribution of recreation activities throughout the year

## Survey Results

The following results were produced by treating each respondent as a single sample (ie. length of stay did not define the data set). A total of 1579 survey forms were returned from the total 3143 forms handed out. Responses were distributed across week days and the total sample period accordingly.

**Table B-1: 1998 Sample Responses at Waldo Lake by Month**

Month	Total Sample Days	Total Sample Periods	Number of Surveys Returned
June	19	21	66
July	31	40	368
August	31	40	606
September	30	38	448
October	31	41	91

**Stay Length** - Respondents averaged slightly over 2 days per Waldo Lake visit. Stay length for campers averaged slightly over 3 days. There was little difference in stay length between campground visitors (*3.32 days*) and dispersed site visitors (*3.06 days*).

**Group Size** - Respondents averaged slightly over 3 people per party, with the largest party being 60 members. Large groups (10 people or more) were atypical and more often campers (4.9%) than day visitors (0.8%). Medium-sized groups (5-9 people) were also more commonly campers (14.9%) than day visitors (7.9%).

**Table B-2: Group Sizes within 1998 Waldo Lake Survey**

Party Size	Day Visitors	Campers
1 to 4 people	719 (91.4%)	635 (80.2%)
5 to 9 people	62 (7.9%)	118 (14.9%)
10+ people	6 (0.8%)	39 (4.9%)
Total	787	792

Percentages are calculated from column totals.

Group size did not vary sharply between campground and dispersed site visitors. Most camping respondents were in parties of 4 or less people (78.7% for campground and 85% for dispersed site respondents). Groups with 5-9 people were slightly more represented in the campground respondents (16.4%) than dispersed site respondents (9.4%). And groups with 10 or more people were equally found in campgrounds (4.9%) and dispersed (5.6%) sites. It is possible that some respondents may have misunderstood the question about group size, by describing the number of people in their vehicle, rather than the size of the social group they were with during their Waldo Lake visit.

**Season of Visitation** – Visitation to Waldo Lake peaked in August and early September, with visitation higher in July than June or October use. The following table shows the distribution of survey responses across the recreation season. Poor weather conditions and the number of days when the lake is snow free influence use during these two shoulder season months. The number of survey days was almost twice as much in October than in June because of weather conditions. For the months of July through September, the use distribution represented by survey responses applied similarly to day visitors and campers.

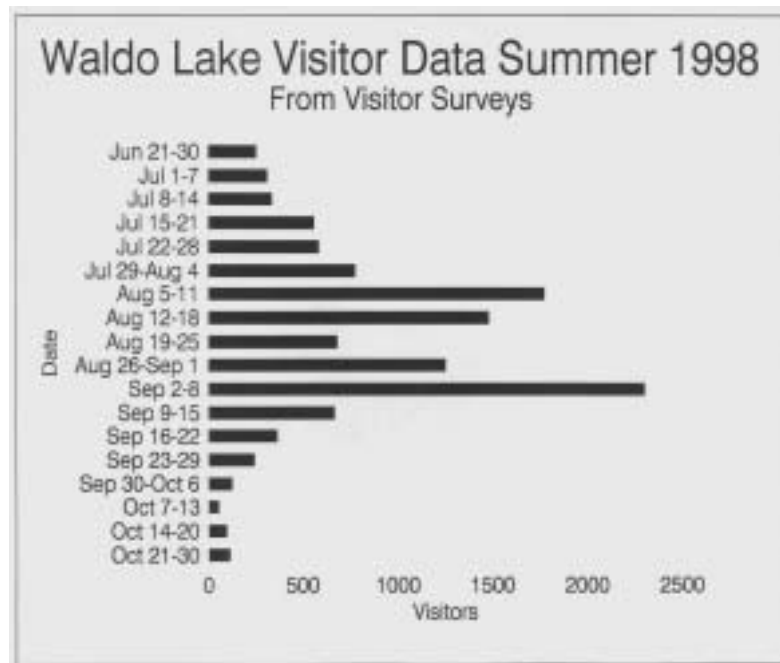
**Table B-3: Visitor Types from 1998 Waldo Lake Survey**

Month of Visit	Total Visitors	Day Visitors	Campers	Campground Users	Dispersed Site Users
June	67 (4.2%)	49 (6.2%)	16 (2.0%)	11 (1.7%)	5 (2.8%)
July	369 (23.4%)	204 (25.9%)	165 (20.8%)	120 (19.1%)	48 (26.7%)
August	605 (38.3%)	250 (31.8%)	356 (45.0%)	294 (46.7%)	72 (40.0%)
September	447 (28.3%)	211 (26.8%)	237 (29.9%)	192 (30.5%)	49 (27.2%)
October	91 (5.8%)	73 (9.3%)	18 (2.2%)	12 (1.9%)	6 (3.3%)
Totals	1579	787	792	629*	180*

Percentages are calculated from column totals.

\* Difference between the sum of these numbers and the total overnight visitors comes from some visitors checking both campground and dispersed sites on survey.

The following histogram displays the distribution of survey respondents across the recreation season. In this display, survey data is influenced by length of stay. This pattern is fairly representative of total use over a typical year at Waldo Lake. Variations in use during the peak summer season occur from year to year due to weather conditions. For example the period August 19-25<sup>th</sup> contained a rainy weekend in 1998.



For most campers, their visits were centered on weekends (Fri.-Sun). This trend did not appreciably differ between campground users and dispersed site users, or by month of the season. Survey results did show one variation in trip planning between campground and dispersed site users. Dispersed site visitors (41.5%) showed a higher preference for arriving on Saturdays than campground users (25.7%).

**Table B-4: Visitors by Arrival Day for 1998 Waldo Lake Survey**

Arrival Day	Total Campers	Campground Users	Dispersed Site Users
Monday	60 (7.7%)	52 (8.5%)	8 (4.9%)
Tuesday	54 (7.0%)	42 (6.9%)	12 (7.3%)
Wednesday	57 (7.3%)	49 (8.0%)	8 (4.9%)
Thursday	82 (10.6%)	70 (11.4%)	12 (7.3%)
Friday	239 (30.8%)	193 (31.5%)	46 (28.0%)
Saturday	225 (29.0%)	157 (25.7%)	68 (41.5%)
Sunday	59 (7.6%)	49 (8.0%)	10 (6.1%)
Total Respondents	776*	612	164

\* 16 respondents selected both campground and dispersed sites and are not represented in this table. Percentages are calculated from column totals.

**Camping Behavior** – About half of the total respondents (50.2%) planned to camp at Waldo Lake. Most overnight visitors (77.3%) stayed in one of the three developed campgrounds, with the rest (21.0%) choosing a dispersed campsite on the lakeshore. A small number of respondents (1.7%) used both developed campgrounds and dispersed campsites during their Waldo Lake visit.

Month of the season influenced the distribution of day visitors and campers. Survey respondents were less likely to camp in June (25%) and October (19.8%) than during the heat of the summer (52.3%). This is not surprising considering the intense mosquito populations at Waldo Lake in June and the colder temperatures in October. When displayed as a percent of total campers by month, dispersed site users had a slightly larger presence in June (31.2%) and October (33.3%), than during the heat of the summer season (22.8%). The small sample sizes in June and October could bias this result.

**Table B-5: Visitor Types by Month from 1998 Waldo Lake Survey**

Month of Visit	Total Visitors	Day Visitors	Campers	Campground Users	Dispersed Site Users
June	67 (4.2%)	49 (75%)	16 (25%)	11 (68.8%)	5 (31.2%)
July	369 (23.4%)	204 (55.3%)	165 (44.7%)	120 (71.4%)	48 (28.6%)
August	605 (38.3%)	250 (41.2%)	356 (58.8%)	294 (80.3%)	72 (19.7%)
September	447 (28.3%)	211 (47.1%)	237 (52.9%)	192 (79.7%)	49 (20.3%)
October	91 (5.8%)	73 (80.2%)	18 (19.8%)	12 (66.7%)	6 (33.3%)
Totals	1579	787 (49.8%)	792 (50.2%)	629* (79.4%)	180* (20.6%)

Percentages in the first column are calculated from total visitors. Percentages for day visitors and campers are calculated from monthly totals. Percentages for campground and dispersed site users are calculated from Camper totals by month.

\* Difference between the sum of these numbers and the total Campers comes from some visitors checking both campground and dispersed sites on survey.

In general, dispersed camping visitors were scattered around the lake zones. Waldo Wilderness sites were the most popular destinations (25.5%) for dispersed campers responding to the survey. Sites on the north (17.0%) and northwest (16.5%) shoreline were the other popular areas for dispersed campers. Twenty-two respondents listed two or more zones for their camping activities. Only 5.9% of dispersed camping respondents claimed to be sleeping on a boat while visiting Waldo Lake.

**Recreation Activities** – Respondents were asked to identify their intended use of trail systems around Waldo Lake and mode of travel. Respondents were also asked to identify boating activities they planned to do, as well as specific information about their boats. Finally respondents were asked to check or list other recreation activities (e.g. swimming, scuba diving, and fishing) they planned to pursue during their Waldo Lake visit.

**Trail Activities** – Slightly more than three-quarters (76.8%) of respondents planned to use trails around Waldo Lake during their trip. Among these trail users, 89.7% planned to travel by foot, 19.0% would travel by bicycle, and 1.6% would travel by stock.

**Table B-6: Trail User Types from 1998 Waldo Lake Survey**

Activity Type	Visitors	Trail Users
Non-Trail Users	366 (23.2%)	
Trail Users*	1213 (76.8%)	
Hikers		1088 (89.7%)
Bicyclists		231 (19.0%)
Stock Riders		19 (1.6%)

\* Sum of trail users exceeds total trail users because some participants used more than one method of travel.

Percentages by trail user type are calculated from total trail users.

Campers were more likely (88.7%) to use trails around Waldo Lake than day visitors (64.8%). Within the Campers group, trail users were more often staying in campgrounds (79.5%) than non-trail users (60%), though this difference could simply be an expression of the overall trend of more visitors using campground than dispersed sites.

**Table B-7: Trail Users by Visitor Type from 1998 Waldo Lake Survey**

Activity Type	Total Respondents	Day Visitors	Campers
Non-Trail Users	366	276 (35.1%)	90 (11.4%)
Trail Users	1213	510 (64.8%)	703 (88.7%)
Total Respondents	1579	787	792

**Boating** – Only 40% of survey respondents planned to boat on Waldo Lake during their visit. Boaters were much more likely to be camping (72.0%) than day visiting (28.0%). By contrast, non-boaters were less likely to be campers (35.5%). This connection between boating and camping was similar for both non-motorized and motorized boating subgroups.

**Table B-8: Boaters by Visitor Type From 1998 Waldo Lake Survey**

Activity Type	Total Respondents	Day Visitors	Campers
All Respondents	1579		
Boaters	633 (40.1%)	177 (28.0%)	456 (72.0%)
Non-Boaters	946 (59.9%)	610 (64.5%)	336 (35.5%)

Percentages for day visitors and campers are calculated off boater and non-boater totals

The survey also asked boaters if their boats had self-contained sanitation devices. Very few (4.3%) boating respondents carried toilet facilities in their craft. This result was not surprising given the dominance of paddle boats and small motorized boats on Waldo Lake.

Most boating respondents used non-motorized craft (86.4%) on the lake, leaving only 13.6% of boating respondents using a motorized craft. Only 4 respondents used both motorized and non-motorized watercraft during their trip.

**Table B-9: Activity Types by Boat Type from the 1998 Waldo Lake Survey**

Activity Type	Total Respondents	Non-motorized	Motorized
Total Boaters	633	547 (86.4%)	86 (13.6%)
Day visitors	177 (28.0%)	153 (86.4%)	24 (13.6%)
Campers	456 (72.2%)	394 (86.4%)	62 (13.6%)
Campground Boaters	356 (78.1%)	313 (87.9%)	43 (12.1%)
Dispersed Site Boaters	100 (21.9%)	81 (81%)	19 (19.0%)

Percentages in the first column are calculated from Total Boater and Campers totals. Percentages in the second and third columns are calculated from totals by Activity Type.

A majority (65.1%) of motorized boats were equipped with 2-cycle motors, followed by 25.6% of boats equipped with 4-cycle motors. Electric motors were used by a small number (9.3%) of surveyed boaters. Motorized boats were typically conventional motorboats of varying sizes. Sailboats represented only 4.9% of all boating respondents and 32.5% of motorized boating respondents. Slightly more than 90.3% of the 31 survey respondents with sailboats were equipped with motors.

**Table B-10: Motor Types from the 1998 Waldo Lake Survey**

Activity Type	Total Respondents
All Motorized Boaters	86
2-Cycle Motors	56 (65.1%)
4-Cycle Motors	22 (25.6%)
Electric Motors	8 (9.3%)



Motorized boats comprised a higher percentage of total boats in June (19.2%) and October (35.0%) than for the other three months or compared to the total seasonal average of 13.0%. This difference may likely be an artifact of a small sample size for these two months. A greater focus on fishing and hunting among visitors in June and October may also explain the increase in motorized boats during these months.

**Table B-11: Boater Types by Month from the 1998 Waldo Lake Survey**

Month of Visit	Total Boaters	Non-motorized	Motorized
June	13 (2.1%)	11 (80.8%)	3 (19.2%)
July	120 (19.0%)	103 (85.8%)	17 (14.2%)
August	279 (44.1%)	245 (87.8%)	34 (12.2%)
September	200 (31.6%)	178 (88.0%)	25 (12.5%)
October	20 (3.2%)	13 (65%)	7 (35%)
Totals	632	550 (86.6%)	86 (13.4%)

Percentages in June and September were adjusted to account for 4 respondents participating in both motorized and nonmotorized boating activities.

One-third (33.7%) of motorized boaters claimed to be fishing during their stay, while 16.8% of non-motorized respondents marked fishing down as an activity. By contrast, only 9.4% of non-boaters were fishing during their stay.

**Other Water Related Activities** - The most frequent water activity listed by respondents was swimming (53.2 %), followed by boating (40.0%) and fishing (13.3 %) showing a small constituency. Scuba diving and windsurfing had very few responses.